

# Fractal properties in naturally fractured reservoir

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## Abstract

A naturally fractured reservoir (NFR) has a complex network of fractures, and this structure may have a fractal properties. The principal parameters that characterized the fractal properties are: the fractal dimension ( $d_f$ ), connectivity ( $\theta$ ) and the fractal dimension of a random walk ( $d_w$ ). The last one is related to the connectivity, so both are consider as dynamics parameters. These are calculated by matching well test data with flux model solutions; and actually the models include these parameters in their equations. In this work we show an alternative to measure the fractality without well test data. Our methodology supposes that NFR has percolation cluster properties and it used as an alternative connectivity ( $\theta_*$ ) meaning that it does not come from dynamics parameters. It consist in measure the fractal dimension and connectivity parameter in sample rocks, by applied box counting method. In addition, we showed our methodology applied to the classical model of NFR, the Sierpinki gasket, and it is compared with the normal connectivity parameter.